

NASA VISION  
MAY 2003  
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# VISION

## ISS EXPEDITION SIX CREW COMES HOME

*The Expedition Six crew members, wearing Russian Sokol suits, pose for a crew photo in the functional cargo block (FGB), or Zarya, on the International Space Station (ISS). Pictured are Astronaut Donald R. Pettit (front), NASA ISS Science Officer; Cosmonaut Nikolai M. Budarin (left back), flight engineer; and Astronaut Kenneth D. Bowersox, Mission Commander. Budarin represents Rosaviakosmos.*



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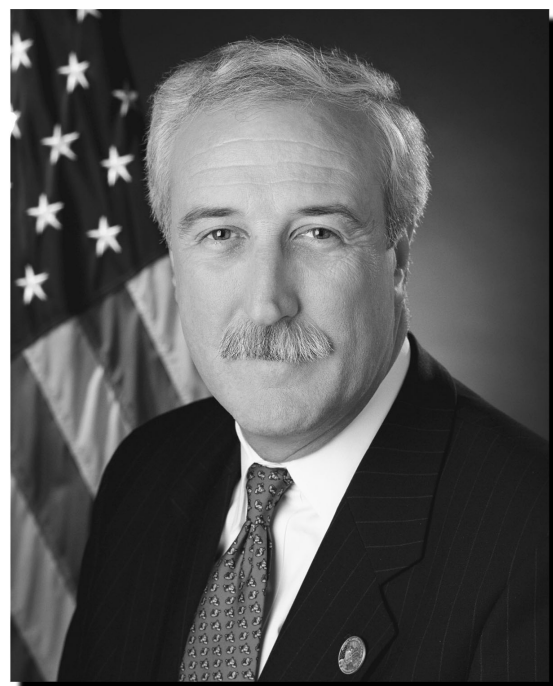
# Administrator's Corner

In the countryside of eastern Texas and western Louisiana, more than 14,000 people from EPA, FEMA, the FBI, Defense Department, the U.S. Forest Service and the Texas and Louisiana National Guards, as well as several state and local law enforcement and emergency service units, have worked long hours under difficult circumstances to recover more than one-third of the Space Shuttle Columbia.

We owe a tremendous debt of gratitude to the citizens of Lufkin, Texas, which is where the main operations have been conducted, and the surrounding communities of Hemphill, Nagodoches, Palestine and Corsicana, which are all an area from Dallas-Fort Worth southeast to the Louisiana-Texas border, and surrounding communities who have welcomed the NASA family and the recovery team members with open arms.

**“As we begin to wrap up our debris recovery effort, we have taken solace in the tremendous outpouring of support from Americans who have given us the strength we need to persevere.”**

**Sean O’Keefe**



*Photo credit: NASA/Bill Ingalls*

In each of these communities there are base camps of more than 1,500 folks set up to cover every acre of a 240-mile-long debris field which is about 10 miles wide. And having searched more than 550,000 acres, the equivalent to covering every acre in the state of Rhode Island, they did that in a span of time less than 90 days.

As we begin to wrap up our debris recovery effort, we have taken solace in the tremendous outpouring of support from Americans who have given us the strength we need to persevere. We’ve heard from thousands of folks who want us to continue our space-flight activities, and, in this spirit of support, we are resolute to learn from the Columbia tragedy and gain the knowledge and wisdom we need to continue advancing our mission goals, as well as providing tangible benefits to millions of Americans and people throughout the world.



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## ASTRONAUTS SET FOR UNPRECEDENTED LANDING

The astronauts of the Expedition Six International Space Station crew are preparing for a first in NASA’s history of human space flight. They’re scheduled to return to Earth aboard a Russian Soyuz capsule.

While the Russians have been using the Soyuz for decades, and an American astronaut has flown into space once before on the craft, NASA has never before put one of its own on a Soyuz for a landing.

The Expedition Six Astronauts, Ken Bowersox and Don Pettit, with their Cosmonaut counterpart Nikolai Budarin at the controls, are scheduled to touch down May 4 (10 p.m. EDT May 3) in northern Kazakhstan. The crew is leaving the station after a successful, but emotional, five-and-a-half months in orbit. During that time, the Space Shuttle Columbia was lost, and the shuttle fleet was temporarily grounded.



*The Expedition Six crew members pose for a crew photo in the Zvezda Service Module on the International Space Station (ISS). From the left are Cosmonaut Nikolai M. Budarin, flight engineer; Astronauts Kenneth D. Bowersox, Mission Commander; and Donald R. Pettit, NASA ISS Science Officer.*

**“The station provides an incomparable platform for scientific research and human space exploration . . .”**

From undocking to landing, the crew’s Soyuz trip is expected to last about three hours and 23 minutes. Just about everything that happens is automated; the crew has little to do but hold on tight.

About 15 minutes before the Soyuz lands, it begins to deploy a series of parachutes to slow its descent. Then, a mere two seconds before landing — less than three feet above the ground — six engines on the spacecraft fire toward the Earth to cushion the touchdown.

Still, a landing in a Soyuz is generally bumpier than on a shuttle, but comfort for the astronauts and cosmonauts is part of the Russian spacecraft’s design. Bowersox, Pettit and Budarin will be riding home in custom-built

seats that conform to their bodies. The seats help cushion the landing and distribute the shock; the impact ranges between three and four Gs.

Of course, after more than five months in space, any gravity will be a shock to the crew. Within minutes of landing, Russian space officials will set up a portable medical tent and carefully take the Soyuz crew members to it, one by one. Bowersox, Pettit and Budarin will spend their first moments back on Earth in special recliners, resting up and readapting to gravity’s pull. About two hours later, they’ll begin a trip to Star City, Russia, where they’ll spend at least 16 days undergoing medical tests and physical therapy.

Back on orbit, another first: the typical three-person space station crew

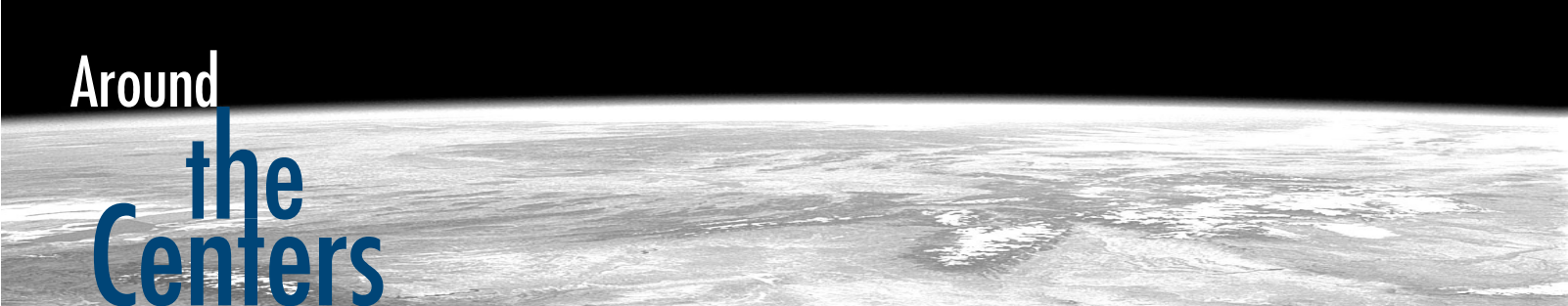
scaled down to two. NASA and its international partners have determined a smaller crew will be able to maintain the station and the scientific experiments on board, while reducing the need for consumables, such as water, aboard the station.

Construction on the station is on hold for now, but it’s at the top of the list of priorities once the shuttles return to flight.

“The target date has been pushed back, but the goal remains the same,” Associate Administrator for Space Flight Bill Readdy says, “U.S. Core Complete — and beyond.”

“The station provides an incomparable platform for scientific research and human space exploration,” he says. “It’s our future.”





# Around the Centers

## *AMESresearchcenter*

NASA Ames Research Center has launched “Women In Science: No Limits,” a new lecture series to provide role models for young women, interest them in science careers and inform general audiences about the research fields of oceanography, atmospheric chemistry and space science. The broad range of speakers from diverse backgrounds, ethnicities and nationalities supports diversity and serves minority, as well as mainstream, audiences. Speakers have included Dr. Marcia McNutt, president and chief executive officer of the Monterey Bay Aquarium Research Institute, and Dr. Azadeh Tabazadeh, an Atmospheric Scientist at NASA Ames. The next speaker will be astronaut Dr. Ellen Ochoa on June 11. The lectures are co-sponsored by NASA Ames, De Anza College and the Center for Women in Science, Technology, Engineering and Mathematics.

## *GLENNresearchcenter*

Dr. Rafat Ansari, an Aerospace Scientist in Glenn Research Center’s Biofluid Sensor Systems/Microgravity Science Division, was a planning committee member and panelist at the “Ohio’s Vision . . . Awaken to the Challenge” conference hosted by Glenn on April 28. The conference focused on the social, economic and quality-of-life challenges that will result from increasing vision problems in Ohio, a growing statewide health issue. Ansari summarized his research involving noninvasive and early detection of eye diseases as a way to find treatments for illnesses in the entire body. Dr. Jonathan B. Clark, a Flight Surgeon at Johnson Space Center, was the luncheon keynote speaker.

## *KENNEDYspacecenter*

Providing premier base support services is Susan Kroskey’s main objective in her new role as Executive Director of the Cape Canaveral Spaceport Management Office (CCSMO). Kroskey assumed the Senior Executive Service position, managing the Joint Base Operations and Support Contract (J-BOSC) for Kennedy Space Center (KSC) and the 45th Space Wing (CCAFS and PAFB) on April 6. She reports to KSC Director Roy Bridges, Jr., and to the 45th Space Wing Commander Brig. Gen. J. Gregory Pavlovich. The Emory University summa cum laude graduate entered federal service in 1982 as a Presidential Management Intern.

## *JETpropulsionlaboratory*

JPL will hold its Open House on Saturday and Sunday, May 17 and 18, taking visitors on a virtual ride through the solar system with this year’s theme, “Journey to the Planets and Beyond.” The fun-filled family event has a little of everything for space enthusiasts and space novices, from virtual flying lessons to building your own spacecraft and having your picture taken with an infrared camera. Visitors will have the opportunity to meet with the Lab’s scientists and engineers who will staff booths to answer questions about current and future missions.

## *JOHNSONspacecenter*

Baseball and space flight came together on April 1 as the STS-107 crew was honored at the Houston Astros’ home opener. The families of the STS-107 crew simultaneously threw out seven “first pitches” to start the Astros’ 2003 season, during which the players will wear the STS-107 mission patch on their uniforms. The pregame tribute also included a live performance by Patti LaBelle, who sang NASA’s anthem “Way Up There” while footage of the crew was shown on the stadium’s video screen. NASA’s astronaut corps and STS-107 mission representatives were also introduced, and the Expedition Six crew greeted Houston baseball fans from the International Space Station. Another moving segment of the tribute was the national anthem, during which Challenger, a trained bald eagle named for the orbiter that was lost in 1986, soared around the stadium. To view images, go to: [io.jsc.nasa.gov/browser.cfm?catid=1991](http://io.jsc.nasa.gov/browser.cfm?catid=1991)

## *DRYDENflightresearchcenter*

During April, the waters off Southern California were studied by both NASA and the Naval Research Laboratory (NRL). These coastal eddies can be important in bringing nutrients from deep to surface waters, where they provide stimulus for ocean plant growth. Eddies can transport pollutants that originated on land, recirculating this material for several days. Scientists from NASA and the Naval Research Laboratory, Washington, D.C., are interested in spiral-shaped slicks, or glassy water, on the ocean’s surface that may result from small-scale eddies in the ocean. NASA will fly its specially instrumented airborne sciences DC-8 jet, based at the NASA Dryden Flight Research Center, over the Southern California Bight to locate eddies using Airborne Synthetic Aperture Radar (AIRSAR).

## *LANGLEYresearchcenter*

The American Institute of Aeronautics and Astronautics (AIAA) has named Thomas Brooks the 2003 recipient of the AIAA Aeroacoustics Award. This award recognizes an outstanding technical or scientific achievement resulting from an individual’s contribution to the field of aircraft community noise reduction. Brooks, a leader and mentor in Langley’s Aeroacoustics Branch, created and guided teams that significantly advanced knowledge in airframe noise, helicopter noise, wind tunnel testing techniques and phased acoustic array technology. The award will be presented May 13 in conjunction with the AIAA/CEAS 9th Aeroacoustics Conference to be held in South Carolina.

## *MARSHALLspaceflightcenter*

It was a grueling, obstacle-strewn course at the U.S Space & Rocket Center in Huntsville, Ala., but Team No. 1 from North Dakota State in Fargo conquered it and rode to victory in the college division of NASA’s 10th annual “Great Moonbuggy Race.” The team topped 23 others representing colleges and universities from 10 states and Puerto Rico. A team from the University of Tennessee Knoxville took second place, and the team from the University of South Alabama in Mobile placed third. On Friday, a team from The Lafayette County (Mo.) C-1 high school in Higginsville, Mo., won the high school division.

## *STENNISspacecenter*

Stennis Space Center Director Bill Parsons recently gave a keynote address at the Choctaw Shift-2 Technology Conference held in Choctaw, Miss. He spoke about the relationship formed between NASA and the Mississippi Band of Choctaw Indians that began in 1995 with the signing of a Space Act Agreement. This partnership brought a regional Educator Resource Center to Choctaw Central High School. He also highlighted a later Space Act Agreement that was designed to share NASA’s knowledge and resources in Earth science applications and resulted in the formation of new high-tech businesses for the tribe.

## *GODDARDspaceflightcenter*

Years spent charting a shadow dance between the Moon and the Sun paid off last month for NASA Astronomer Fred Espenak, an alumnus of Wagner College, Staten Island, N.Y., with an asteroid that bears his name. The organization that assigns official names to celestial objects, the International Astronomical Union (IAU), designated “minor planet 14120” as “Espenak” in the Smithsonian Astrophysics Center Minor Planet Circular #48157, issued March 18. “It’s quite an honor to have a piece of real estate in the solar system named after you,” said Espenak, who is a world-renowned authority on solar eclipse predictions at NASA Goddard Space Flight Center, Greenbelt, Md.

# News

## NASA Rovers to Examine Two Intriguing Mars Sites

NASA has chosen two scientifically compelling landing sites for its twin robotic rovers to explore on the surface of Mars early next year: a giant crater that appears to have once held a lake and a broad outcropping of a mineral that usually forms in the presence of liquid water.

NASA’s two Mars Exploration Rovers will examine the sites for geological evidence of past liquid water activity and past environmental conditions hospitable to life.

“Landing on Mars is very difficult, and it’s harder on some parts of the planet than others,” said Dr. Ed Weiler, NASA Associate Administrator for Space Science in Washington. “In choosing where to go, we need to balance science value with engineering safety considerations at the landing sites. The sites we have chosen provide such balance.”

The first rover, scheduled for launch May 30, will be targeted to land at Gusev Crater, 15 degrees south of Mars’ equator. The second, with a June 25 launch date, will be targeted to land at Meridiani Planum, an area with deposits of an iron oxide mineral (gray hematite) about two degrees south of the equator and halfway around the planet from Gusev.

What rover is targeted to what site is still considered tentative, while further analyses and simulations are conducted. NASA can change the order as late as approximately one month after the launch of the first rover. The first mission will parachute to an airbag-cushioned landing on Jan. 4, 2004, and the second on Jan. 25, 2004.

Images and measurements from two NASA spacecraft now orbiting Mars provided scientists and engineers evaluating potential landing sites with details of candidate sites’ topography, composition, rockiness and geological context.

“Meridiani and Gusev both show powerful evidence of past liquid water, but in very different ways,” said Dr. Steve Squyres, Principal Investigator for the rovers’ science toolkit and a geologist at Cornell University, Ithaca, N.Y. “Meridiani has a chemical signature of past water. Gray hematite is usually, but not always, produced in an environment where there is liquid water. At Gusev, you’ve got a big hole in the ground with a dry riverbed going right into it. There had to have been a lake in Gusev Crater at some point. They are fabulous sites, and they complement each other because they’re so different.”

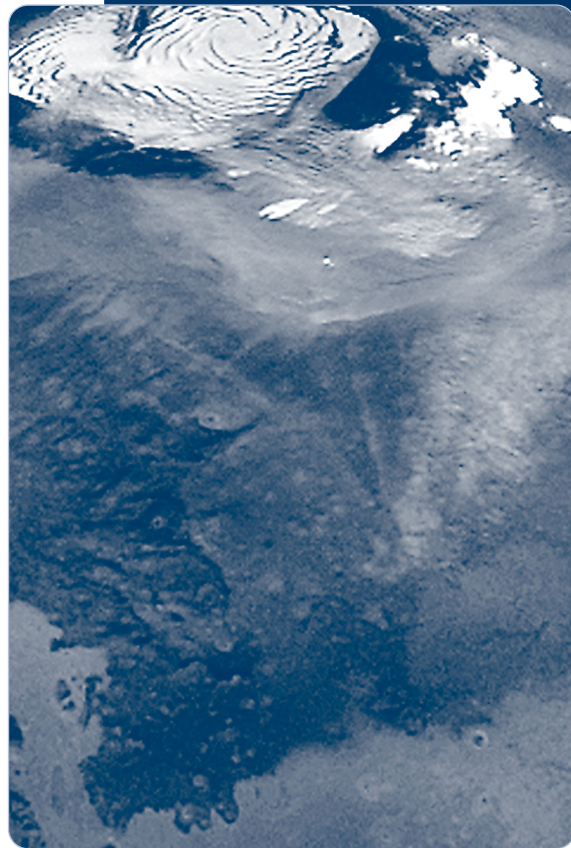
For landing site images and project information, go to: [www.jpl.nasa.gov](http://www.jpl.nasa.gov)

## MGS Camera Team Posts Daily Photos of Mars

The camera team for NASA’s Mars Global Surveyor (MGS) mission began daily Internet postings of pictures starting April 15 that showcase the rich diversity of martian landscapes.

The first “Mars Orbiter Camera Picture of the Day” shows frost-covered sand dunes in the springtime as they begin to defrost. It is available online at the camera team’s Web site where a different picture will be posted every day, including weekends and holidays.

[www.msss.com](http://www.msss.com)



*This composite of Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) wide-angle daily global images shows a north polar dust storm on March 7, 2003. Similar late summer storms occurred nearly every day from late February well into April 2003; these also were seen in late summer in 1999 and 2001. The white features at the top of the image are the water ice surfaces of the north polar residual cap. Sunlight illuminates the scene from the lower left.*



# Researchers Encouraged by Collision-Avoidance Test

Scaled Composites' unique tandem-wing Proteus was the test bed for a series of UAV collision-avoidance flight demonstrations. An Amphitech 35GHz radar unit installed below Proteus' nose was the primary sensor for the Detect, See and Avoid tests.

The latest round of flight tests has NASA and industry researchers confident that a pilot in a remote ground station can safely detect and avoid collisions between an Unmanned Aerial Vehicle (UAV) and other aircraft in the skies. Detect, see and avoid technology is vital if remotely piloted or autonomous aircraft are to be integrated into the airspace system shared with inhabited aircraft.

The tests took place April 1–4 near Mojave, Calif., and were sponsored by NASA Dryden Flight Research Center under the Environmental Research Aircraft and Sensor Technology (ERAST) program.

“The goal of the test was to be able to make a decision based on radar data in enough lead time to maneuver the test aircraft to avoid a close encounter with the intruder aircraft,” said Glenn Hamilton, UAV Subsystems Project Manager at NASA Dryden.

Scaled Composites' Proteus aircraft, with safety pilots on board but controlled from the ground like a true UAV, was repeatedly directed away from conflicting flight paths with a variety of aircraft, some of which did not emit any signals to show their positions in the sky.

In all 20 scenarios flown, Proteus' ground operator was able to detect the presence of other aircraft that posed the potential for collisions, maneuvering the test aircraft to keep the intruding aircraft outside an imaginary 500-ft. bubble of safe airspace surrounding Proteus. The conflicting aircraft ranged greatly in speed, from a NASA F/A-18 high-speed jet to several types of general aviation aircraft and an unpowered sailplane. A hot-air balloon had been on the roster, but winds at Mojave precluded its use in this round of tests.

The use of radar to detect these aircraft included one surprise — a 1940s vintage fabric-covered Stinson Voyager made a larger-than-expected radar signature, possibly due to its large aluminum-covered tail surfaces.

The recent tests follow a series last year near Las Cruces, N.M., in which Proteus' remote pilot, using data from another detection device, was able to avoid conflict with aircraft that used transponders to identify their positions. Researchers are encouraged by the results of both test series, but they say that more work is required before a refined operational detect, see and avoid system can be fielded.

Scaled Composites' Proteus aircraft with an F/A-18 Hornet and a Beechcraft KingAir from NASA Dryden Flight Research Center during a low-level flyby at Mojave Airport in Southern California.

Proteus DSA control room in Mojave, Calif. (l to r): Jean-Pierre Soucy, Amphitech International Software engineer; Craig Bomben, NASA Dryden Test Pilot; Pete Siebold (with headset, at computer controls), Scaled Composites pilot; Bob Roehm, New Mexico State University (NMSU) UAV Technical Analysis Application Center (TAAC); Chuck Coleman, Scaled Composites pilot; Kari Sortland, NMSU TAAC; and Russell Wolfe, Modern Technology Solutions, Inc.

Scaled Composites' Proteus aircraft and an F/A-18 Hornet from NASA Dryden Flight Research Center at Mojave Airport in Southern California. NASA Dryden's F/A-18 Hornet was one of many different aircraft used in the tests.







# SPACE STATION AstroPhotography



Astronaut Don Pettit on board the ISS.

It's a weird place for an astronomer. Meteors fly underfoot. Auroras appear just inches in front of your nose. City lights twinkle, but stars don't. Astronaut Don Pettit loves every minute of it. "There's always something good to see out the window of the Space Station," says Pettit, an amateur astronomer and NASA's science officer for the International Space Station (ISS).

"Lately we've been having some extraordinary auroras," he said. "They meander like big green amoebas crawling across the sky. These lights are constantly changing. They swirl. Bright spots come and go. Green blobs transform into upward-directed rays topped by red feathery structures."

Auroras are caused by electrons and protons from space raining down on Earth's atmosphere. When they hit the top of the atmosphere, they excite atoms and molecules and make the air glow. Reds and greens come from atomic oxygen, blues from nitrogen.

Auroras aren't all: "I've seen an occasional meteor while looking down through the Destiny Lab window," Pettit said. Meteors disintegrate in Earth's atmosphere below the Space Station, so you have to look down to see them! "You can also see space junk orbiting nearby. And there are satellites, too. A

flash of sunlight glinting off an Iridium satellite near the Southern Cross really brought a smile to my face."

One of the curious things about sky watching from orbit is the appearance of stars. "They don't twinkle," says Pettit. Twinkling is caused by irregularities in Earth's atmosphere that refract starlight to and fro. But in orbit there is no atmosphere. Stars are remarkably steady and piercing.

For sheer beauty, though, "my favorite is still auroras," he says. "I can't get enough of them." Pettit is scheduled to remain on board the ISS until May. Between now and then, in his spare time, he plans to continue taking pictures and sending them to Earth.

For more images, go to:  
[science.nasa.gov/headlines/y2003/24mar\\_noseprints.htm](http://science.nasa.gov/headlines/y2003/24mar_noseprints.htm)

*(image at left) This nighttime view of the British capital offers unique insight into the city's urban density and infrastructure as highlighted by electrical lighting. Interpreting the brightest areas as the most populated, the population density drops off rapidly from the bright urban center until it reaches the vicinity of the Orbital, an encircling roadway. Beyond lie isolated bright areas marking the numerous smaller cities and towns of the region and as far southeast as Hastings on the coast. Note London's two major airports, Heathrow and Gatwick, and the particularly bright, sinuous stretch of the Orbital to the south of the city.*

*The crew of the International Space Station acquired this image shortly after 7:22 p.m. local time on the evening of February 4, 2003. Either thin, low clouds or perhaps fog is evident in the fuzzy character of patterns for some of the surrounding smaller cities, while that of the warmer urban center is still clear and sharp.*

# Profile

## Retha Whewell

Your name and title:

Retha Whewell, Executive Assistant to the Administrator

Briefly describe your current position:

Manage and filter the flow of information to the Administrator in a timely fashion; review material for quality assurance and coordination among senior staff prior to sharing with the Administrator; use judgment with regard to internal and external schedule requests; and supervise the Administrator's immediate staff.

Briefly describe your career history:

While in college, I worked within various administrative offices at my local tribal government in upstate New York. After graduating from the State University of New York at Potsdam with a bachelor's degree in business economics, I served as residence director for a local business institute in Central New York. Soon thereafter, I began working at Syracuse University as an assistant to an Endowed Chair of Business and Government Policy and the Director of National Security Studies while taking part-time graduate classes. During the 2001 Administration transition, I relocated to D.C. to provide administrative support to the Deputy Director of the Office of Management and Budget, and, most recently, transitioned to provide support to the NASA Administrator.



Photo credit: NASA/Renee Bouchard

Briefly describe your goals and objectives for your current position:

To continue to represent and provide executive-level support to the Administrator and Agency as they pursue the Agency mission.

Please list your hometown, hobbies and family:

Hometown: Syracuse, N.Y.; Family: Jay (spouse); Pets: Dogs: Jewell and Lili; Cat: Mya.



Photo credit: Tech. Sgt. Ken Bergmann

## 19th Annual Space Symposium

*Administrator Sean O'Keefe was a featured speaker at the 19th National Space Symposium held in Colorado Springs, Colo., April 7-10, 2003. Widely regarded as the premier conference for space professionals anywhere in the world today, the National Space Symposium is the only space-related conference to fully integrate all sectors of space — commercial, civil and national security — while attracting the most important and influential speakers, and the national leadership of the space industry.*





## THE NASA FAMILY ASSISTANCE FUND



"The NASA Family Assistance Fund is an opportunity for all of us to help provide for the families of the STS-107 crew and also the families of other NASA employees who have lost their lives while serving the Agency and the American people. Our contributions to this fund will touch the lives of these courageous families and will ensure their personal legacies are remembered."

—Sean O'Keefe  
Administrator

For more information, visit <http://www.nasa.gov> or call the Federal Employee Education and Assistance Fund at 1-800-338-0755.

NASA Administrator Sean O'Keefe announced the formation of the NASA Family Assistance Fund. The fund was created in response to the numerous requests of Agency employees to support the families of STS-107 and other NASA families during their times of need. Formed in cooperation with the Federal Employee Education and Assistance Fund (FEEA), the NASA Family Assistance Fund will provide need-based financial assistance and educational assistance to the families of the seven Columbia astronauts, as well as to other families of NASA personnel who die as the result of personal injuries suffered in the performance of their official duties. For additional information, go to: [www.nasa.gov/about/overview/AN\\_FAF.html](http://www.nasa.gov/about/overview/AN_FAF.html)

## Opening of Columbia Cafe

Administrator O'Keefe and the contest winners are seen cutting the ribbon at the opening of the Columbia Café, the winning suggestion for the newly remodeled and re-invigorated 9th-floor representational facility, during a reception held on April 14 at 11:30 a.m. As of April 15, a light breakfast service is available from 7:30 to 9:30 a.m., with lunch extending from 11:30 a.m. to 1:30 p.m. Plan to dine in the Columbia Cafe, which will feature a wait service for your convenience.

## NASA HQ Secretarial Awards Luncheon



The HQ Secretarial/Clerical Awards Luncheon was held Wednesday, April 23, at the Discovery Ballroom, Holiday Inn Capital. Associate Deputy Administrator for Institutions and Asset Management, James L. Jennings; Patrice Williams, the first-place award winner from Code P; and Administrator O'Keefe pose at the luncheon. Secretaries, clerks, assistants and technicians were eligible for the awards. Nominations were based on personal knowledge or awareness of the nominees performance. For details, go to: [www.hq.nasa.gov/hq/hqsec.htm](http://www.hq.nasa.gov/hq/hqsec.htm)



## Testing Children's Eyes in a Flash

" . . . as quick as taking a photo."

Picture a group of children in kindergarten giggling and fidgeting while standing in a line. They're getting ready for a test, but you'd never know it by looking at them. They're lining up for a simple, inexpensive eye test that is literally as quick as taking a photo.

But this test helps determine if a child has vision problems. It's a test that, in many cases, will change a child's life.

The Space Foundation honored the technology that creates scenes like this every day throughout the country. The VisiScreen® Ocular Screening System is one of the six new members of the Foundation's Space Technology Hall of Fame. The basis for VisiScreen® originated at the Marshall Space Flight Center and was developed as a commercial system by Vision Research Corporation of Birmingham, Ala. NASA's work on image processing and space optics led innovators at the Marshall Space Flight Center to develop and patent a method and device for detecting human eye defects.

With the help of NASA's technology transfer program, individuals and companies transitioned the technology into the



commercial arena. Under an exclusive license from NASA, Vision Research Corp. began marketing the technology in 1991. Over the past several years, Vision Research has screened almost two million children for eye problems in public schools.

VisiScreen® detects a wide range of eye problems, including nearsightedness, farsightedness, alignment problems, opacities such as cataracts, differences in the eyes that can indicate or lead to amblyopia — often called "lazy eye" — and a number of other ocular abnormalities. The system includes a special camera, lens and electronic flash. The flash sends light into the child's eyes, which is reflected from the retina back to the camera lens, producing a revealing image. Examination of the image by a trained observer then identifies abnormalities.

To learn more about technology transfer managed by the Marshall Center, visit the Web site: [techtran.msfc.nasa.gov](http://techtran.msfc.nasa.gov)

For more information about Vision Research Corporation and the VisiScreen® system, visit the Web site: [www.vision-research.com](http://www.vision-research.com)

**freedom<sup>2</sup>manage**  
Working to be efficient, effective, and accountable

For updates and information, go to:  
[www.f2m.nasa.gov](http://www.f2m.nasa.gov)



NASA VISION  
MAY 2003

*Cosmonaut Yuri I. Malenchenko (left), Expedition Seven Commander, and Astronaut Edward T. Lu, NASA ISS Science Officer and Flight Engineer, take time out from practicing launch procedures in a Soyuz capsule simulator as part of their training at the Gagarin Cosmonaut Training Center in Star City, Russia. Malenchenko and Lu are scheduled to be launched in the spring of this year from the Baikonur Cosmodrome in Kazakhstan in a Soyuz TMA-2 capsule to begin a six-month stay on the International Space Station.*

## EXPEDITION SEVEN CREW SET TO LAUNCH

Veteran Russian Cosmonaut Yuri Malenchenko (Col., Russian Air Force) and veteran NASA Astronaut Ed Lu have been named as the primary crew for the planned April 26, 2003, launch of a Russian Soyuz TMA-2 spacecraft to the International Space Station.

Cosmonaut Yuri Malenchenko, who began cosmonaut training in 1987, has logged 137 hours in space. Malenchenko and Lu will be called the Expedition Seven crew. Russian Cosmonaut Alexander Kaleri and NASA Astronaut Michael Foale are the backup crew members to Malenchenko and Lu.

Malenchenko commanded a four-month mission aboard the Mir Space Station in 1994. He participated in the STS-106 mission aboard Atlantis in 2000 to prepare the International Space Station for permanent human occupancy.

Astronaut Ed Lu was selected for the astronaut corps in 1994. Lu is a veteran of two shuttle flights. In 1997, he flew aboard Atlantis to the Mir Space Station on the STS-84 mission to exchange U.S. residents on the Russian complex, and he joined Malenchenko on STS-106. Malenchenko and Lu were originally scheduled to fly with Kaleri on Expedition Seven to the station, which had been scheduled to launch on the STS-114/ ULF-1 (Utilization and Logistics Flight-1) mission in March.

Malenchenko and Lu will continue to operate the science payloads already on board, as well as maintain the station.



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